

REMARKS

Applicant has carefully reviewed the Office Action mailed September 17, 2009 and offers the following remarks. Claims 1-34 remain pending.

Claims 1 and 18 were rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement. The Patent Office alleges that “the mode of operation for independently determining communication schedules as claimed in Claim 1 is not fully supported by the description See (page 6 L 25-32)” (Office Action mailed September 17, 2009, p. 2). However, the Patent Office then argues that the specification discloses certain features which are “essential features” and these features should be included in the claims to define the best mode of operation. *Ibid.* Applicant is not sure if the Patent Office is rejecting claims 1 and 18 for lack of written description or for failure to claim essential elements, which are two separate questions.

To comply with the written description requirement, the objective standard for determining compliance is, “does the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed.” M.P.E.P. § 2163.02, citing *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989). “The subject matter of the claim need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement.” M.P.E.P. § 2163.02.

In the current case, claim 1 recites, in pertinent part, the steps of “determining a communication schedule for communications with the at least one compatible communication node based on the scheduling information” and “communicating with the at least one compatible communication node based on the communication schedule, wherein communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes.” The Specification supports these steps. In fact, the Patent Office admits as much by referring to specific ways to accomplish the claimed steps (Office Action mailed September 17, 2009, p. 2, lines 16-23). In addition, paragraphs 0007, 0022-0025, 0032-0035, 0037, 0038, and 0043, and Figures 2-5 support the claimed step of “wherein communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes” in sufficient detail that one of ordinary skill in the art would recognize that the inventors were in possession of the claimed subject matter at the time the application was filed.

With respect to the features that the Patent Office alleges are “essential features,” Applicant respectfully disagrees and submits that the features mentioned by the Patent Office are merely preferred embodiments. Features of a preferred embodiment are not to be considered critical and do not have to be recited in the claims, and especially not the independent claims, like claims 1 and 18. M.P.E.P. § 2164.08(c). Moreover, a rejection based on the grounds that a disclosed critical limitation is missing from a claim should be made only when the language of the specification makes it clear that the limitation is critical for the invention to function as intended. *Ibid.* In determining whether an unclaimed feature is critical, the entire disclosure must be considered. Broad language in the disclosure, including the abstract, omitting an allegedly critical feature, tends to rebut the argument of criticality. *Ibid.*

In the present application, the language of the Specification does not make it clear that the features of comparing the scheduling criteria at the second node and previously negotiating a transmission opportunity are essential or critical to practicing the invention. The portion of the Specification (page 6, lines 25-32) cited by the Patent Office merely discloses one embodiment. In addition, there is broad language in the disclosure that does not mention the features mentioned by the Patent Office. Notably, the abstract lacks any mention of the allegedly critical comparison of scheduling information. The abstract does mention a transmission opportunity, but clearly uses language to indicate this feature is optional and not critical (See Abstract, “This communication schedule may dictate when information is received from or sent to a compatible communication node during a given transmission opportunity.”) (emphasis added).

In light of these remarks and the applicable M.P.E.P. sections, Applicant respectfully submits that claims 1 and 18 do not omit an essential step. Claims 1 and 18 are also supported by the Specification in sufficient detail to convey to one of ordinary skill in the art that the inventors had possession of the invention as claimed at the time the application was filed. Accordingly, Applicant respectfully submits that the rejection of claims 1 and 18 under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement, be withdrawn.

Claims 9 and 26 were also rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement. The Patent Office alleges that the Specification discloses that “in order to achieve independent clocks, a relative time is calculated with respect to a reference point, which may be used as a global time instant for a pair of

communication nodes” and that the “transmission opportunities are founded as a function of the maximum drift of the individual clocks to avoid scheduling issues when using independent clocks.” (Office Action mailed September 17, 2009, p. 3). Claims 9 and 26 both recite “wherein the communication nodes in the wireless communication network maintain independent clocks, which are not synchronized with one another.” Thus, all that is required to comply with the written description requirement is that the Specification discloses the **claimed limitation** in sufficient detail such that one of ordinary skill in the art would recognize that the inventors were in possession of the claimed subject matter at the time the application was filed. The portion of the Specification on page 13 that is cited by the Patent Office is merely one specific way to enable the use of independent clocks. It is not necessary for purposes of 35 U.S.C. § 112 that the specific way be part of the claims. It is clear from reading the Specification (see, e.g., paragraphs 0037-0040 and Figure 4) that the inventors recognized as part of their invention that “the communication nodes in the wireless communication network [can] maintain independent clocks, which are not synchronized with one another.” That is all that is necessary to comply with the written description requirement. Accordingly, Applicant respectfully submits that the rejection of claims 9 and 26 under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement, be withdrawn.

Claims 5 and 22 were rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite. In particular, the Examiner states that it is not clear what is meant by the claim term “in serial fashion.” In reviewing a claim for compliance with 35 U.S.C. § 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. § 112, second paragraph, by providing clear warning to others as to what constitutes infringement of the patent. See, e.g., *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379, 55 U.S.P.Q.2d (BNA) 1279, 1283 (Fed. Cir. 2000). The examiner’s focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. § 112, second paragraph, is whether the claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire. Examiners should not reject claims or

insist on their own preferences if other modes of expression selected by applicants satisfy the statutory requirement. M.P.E.P. § 2173.02.

In the present case, Applicant respectfully submits that one of ordinary skill in the art having read the Specification (particularly paragraphs 0007 and 0041) knows what is meant by the term “serial fashion.” “In a serial fashion” simply means that it is done in series (*i.e.*, not in parallel, or at the same time). In light of the above arguments, Applicant respectfully submits that the rejection of claims 5 and 22 under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite, be withdrawn.

Claims 1, 6-8, 11-13, 16-18, 23-25, 28-30, 33, and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over European Patent No. EP 1059773 A2 to Itai et al. (hereinafter “Itai”) in view of U.S. Patent Application Publication No. 2005/0232224 to Belschner et al. (hereinafter “Belschner”). Applicant respectfully traverses. In order to establish *prima facie* obviousness, “[a]ll words in a claim must be considered” and all limitations must be taught or suggested by the prior art. MPEP § 2143.03, In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Additionally, “there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness” to establish obviousness. KSR Int’l v. Teleflex, Inc., 550 U.S. 398, 418, 82 USPQ.2d 1385, 1396 (2007).

Embodiments described in the present application provide a scheduling technique that allows individual nodes in a wireless communication network to independently determine their own communication schedules. In one embodiment, the communication nodes in the wireless communication network are associated with one or more compatible communication nodes through a shared communication medium. This shared medium may be turned into a set of substantially non-contending communication links, wherein the communication links within a group of compatible communication nodes are substantially non-interfering. In one or more of the described embodiments, each node will exchange scheduling information with the various compatible communication nodes, and determine the communication schedule for future communications with those compatible communication nodes. In another embodiment, each of the communication nodes has an independent clock, which is not synchronized with the clocks of other compatible communication nodes or a common reference clock.

Claim 1 is representative and recites a method comprising:

exchanging scheduling information with at least one compatible communication node in a wireless communication network;

determining a communication schedule for communications with the at least one compatible communication node based on the scheduling information; and

communicating with the at least one compatible communication node based on the communication schedule, wherein communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes.

The combination of Itai and Belschner fails to teach or suggest each and every limitation of claim 1. In particular, the combination of Itai and Belschner does not teach or suggest “exchanging scheduling information with at least one compatible communication node” and “determining a communication schedule for communications with the at least one compatible communication node based on the scheduling information,” as recited in the claimed invention. In addition, the combination of Itai and Belschner does not disclose or suggest “wherein communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes.” The Patent Office alleges that paragraph 0018 of Itai discloses “exchanging scheduling information with at least one compatible communication node” (Office Action mailed September 17, 2009, p. 4). Applicant respectfully disagrees.

Paragraph 0018 of Itai discloses a wireless mesh topology network having mutually interconnected, line-of-sight nodes 12-19. In each time frame, “every node has scheduled slots with which to exchange control information with each of its neighbors.” (Itai, paragraph 0018). “Any time a node is not participating in a control channel transmission or reception, it is free to schedule the transmission or reception of data packets.” *Ibid.* Applicant initially notes that the nodes in Itai exchange control information, not scheduling information. Moreover, although the nodes in the network of Itai are mutually interconnected, there is no mention that they are “compatible” as defined in the claimed invention. In fact, in Itai, every node communicates with each of its neighbors.

In contrast, in the claimed invention, the various communication nodes in the wireless access network are configured only to communicate with select compatible communication nodes. Communication links are established between pairs of compatible communication nodes; different communication links may use different modulation, space, time, and/or frequency

parameters in order to minimize the potential for one communication link to interfere with other communication links. In this way, the disadvantages of a centralized scheduling scheme are avoided, and there is no need for each of the communication nodes to synchronize to a common time base. Each node will independently determine the communication schedules with its compatible communication nodes.

The nodes in Itai are not configured only to communicate with select compatible communication nodes. Itai is silent as to compatible network nodes; Itai does not disclose any determination of compatible nodes and does not disclose that scheduling information is exchanged between compatible nodes. Itai also does not disclose that a communication schedule is determined for communications with compatible nodes based on the scheduling information exchanged between compatible nodes. Itai discloses that every node communicates with each of its neighbors. Thus, Itai does not teach or suggest “exchanging scheduling information with at least one **compatible communication node** in a wireless communication network” and “determining a communication schedule for communications with the at least one **compatible communication node** based on the scheduling information,” as recited in claim 1. Belschner does not cure the deficiencies of Itai in this regard. Since the combination of Itai and Belschner does not teach each and every limitation of claim 1, claim 1 is patentable.

In addition, the combination of Itai and Belschner does not teach or suggest that the communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes, as recited in claim 1. The Patent Office admits that Itai does not teach or suggest that the communication nodes **independently** determine communication schedules with compatible communication nodes, but argues that the Abstract and paragraph 0025 of Belschner discloses this limitation (Office Action mailed September 17, 2009, p. 5). Applicant respectfully disagrees.

Belschner does not teach or suggest that the communication nodes in the wireless communication network independently determine communication schedules with other compatible communication nodes, as recited in claim 1. This can be seen from the fact that the a network node in Belschner is integrated as an active node only “if it adapts its local communication time schedule to that of the reference node . . . and if a check as to whether its own communication time schedule agrees with the communication time schedules of at least some of the active network nodes proves positive.” (Belschner, Abstract). Further, Belschner

makes clear that a “**common** communication time schedule must be established in the network nodes.” (Belschner, paragraph 0007, emphasis added). Moreover, the “time schedule is already determined before operation” in Belschner (Belschner, paragraph 0008). In addition, a “common communication time schedule must be established in the network nodes 1 through 4” (Belschner, paragraph 0027). Thus, it is clear that Belschner teaches that a **common** schedule must be determined and therefore Belschner does not disclose or suggest that the communication nodes in the wireless communication network **independently** determine communication schedules with other compatible communication nodes, as recited in claim 1.

Belschner does disclose that the network nodes each have a local clock (Belschner, paragraph 0025). However, only the **processing** of a communication time schedule is based on the local clock cycle, not the determination of the schedule. *Ibid.* There is no indication that the node uses the local clock to **independently determine** communication schedules with other compatible communication nodes, as recited in claim 1. In fact, the local clock of the node in Belschner must be synchronized with a global clock (Belschner, Figure 2 and paragraphs 0025 and 0028). Since Belschner is a synchronized network, there must be a common global clock and the schedules are based on a common clock. The nodes in Belschner thus do not **independently** determine communication schedules. The Patent Office has admitted that Itai does not teach or suggest this limitation. Thus, the combination of Itai and Belschner does not teach or suggest “wherein communication nodes in the wireless communication network **independently** determine communication schedules with other compatible communication nodes,” as recited in claim 1. Claim 1 is not anticipated by Garcia for this additional reason.

Claims 6-8, 11-13, 16, and 17 depend from claim 1 and include all of the limitations of claim 1. Claims 6-8, 11-13, 16, and 17 are therefore patentable for at least the same reasons set forth above with respect to claim 1.

Claim 18 is directed to a system and recites limitations similar to the limitations of claim 1. Claim 18 is thus patentable for at least the same reasons set forth above with respect to claim 1.

Claims 23-25, 28-30, 33, and 34 depend from claim 18 and include all of the limitations of claim 18. Claims 23-25, 28-30, 33, and 34 are therefore patentable for at least the same reasons set forth above with respect to claim 18.

Claims 2-4, 14, 15, 19-21, 31, and 32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and further in view of U.S. Patent No. 6,788,702 to Garcia-Luna-Aceves et al. (hereinafter “Garcia”). Applicant respectfully traverses. The standards for obviousness are set forth above.

Claims 2-4, 14, and 15 depend from claim 1 and include all of the limitations of claim 1. Claims 19-21, 31, and 32 depend from claim 18 and include all of the limitations of claim 18. As set forth above, the combination of Itai and Belschner does not teach or suggest each and every limitation of claims 1 and 18. Garcia does not cure the deficiencies of Itai and Belschner in this regard (see also Response filed September 9, 2009, pp. 2-8). Thus, claims 2-4, 14, 15, 19-21, 31, and 32 are patentable over the combination of Itai, Belschner, and Garcia.

Claims 5 and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and Garcia and further in view of U.S. Patent No. 6,542,476 to Elizondo et al. (hereinafter “Elizondo”). Applicant respectfully traverses. The standards for obviousness are set forth above.

Claim 5 depends from claim 4, which depends from claim 1. Claim 5 thus includes all of the limitations of claim 1. Claim 22 depends from claim 21, which depends from 18. Claim 22 thus includes all of the limitations of claim 18. As set forth above, the combination of Itai, Belschner, and Garcia does not teach or suggest each and every limitation of claims 1 and 18. Elizondo does not cure the deficiencies of Itai, Belschner, and Garcia in this regard. Thus, claims 5 and 22 are patentable over the combination of Itai, Belschner, Garcia, and Elizondo.

Claims 9 and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and further in view of U.S. Patent Application Publication No. 2003/0067873 to Fuhrmann et al. (hereinafter “Fuhrmann”). Applicant respectfully traverses. The standards for obviousness are set forth above.

Claim 9 depends from claim 1. Claim 9 thus includes all of the limitations of claim 1. Claim 26 depends from 18. Claim 26 thus includes all of the limitations of claim 18. As set forth above, the combination of Itai and Belschner does not teach or suggest each and every limitation of claims 1 and 18. Fuhrmann does not cure the deficiencies of Itai and Belschner in this regard. Thus, claims 9 and 26 are patentable over the combination of Itai, Belschner, and Fuhrmann.

In addition, with respect to claims 9 and 26, these claims recite the additional limitation of “wherein the communication nodes in the wireless communication network maintain independent clocks, which are not synchronized with one another.” As discussed above, and as admitted by the Patent Office (Office Action mailed September 17, 2009, p. 11), the combination of Itai and Belschner does not teach this limitation. Fuhrmann also does not disclose this limitation. Fuhrmann discloses that there may be a global clock signal and a local clock signal. The local clock signal may be independent from corrections made to the global clock signal (Fuhrmann, paragraphs 0014 and 0015). However, there is no mention that the global and local clock signals in Fuhrmann are associated with the compatible communication nodes of the claimed invention. In fact, the local clock signal in Fuhrmann is derived statically from a quartz oscillator (Fuhrmann, paragraph 0014). Thus, the global clock and the local clock in Fuhrmann are not equivalent to the claimed independent, non-synchronized clocks of communication nodes. Fuhrmann does not teach or suggest that the communication nodes maintain independent clocks, which are not synchronized with one another, as recited in claims 9 and 26. For these reasons, Fuhrmann does not teach “wherein the communication nodes in the wireless communication network maintain independent clocks, which are not synchronized with one another.” Claims 9 and 26 are patentable for this additional reason.

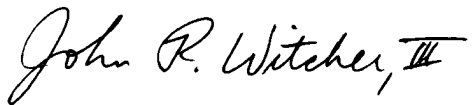
Claims 10 and 27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Itai and Belschner and further in view of U.S. Patent Application Publication No. 2004/0176098 to Besset-Bathias et al. (hereinafter “Besset-Bathias”). Applicant respectfully traverses. The standards for obviousness are set forth above.

Claim 10 depends from claim 1 and thus includes all of the limitations of claim 1. Claim 27 depends from 18 and thus includes all of the limitations of claim 18. As set forth above, the combination of Itai and Belschner does not teach or suggest each and every limitation of claims 1 and 18. Besset-Bathias does not cure the deficiencies of Itai and Belschner in this regard. Thus, claims 10 and 27 are patentable over the combination of Itai, Belschner, and Besset-Bathias.

The present application is now in condition for allowance and such action is respectfully requested. The Examiner is encouraged to contact Applicant’s representative regarding any remaining issues in an effort to expedite allowance and issuance of the present application.

Respectfully submitted,

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Date: January 19, 2010

Attorney Docket: 7000-365-1A